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Scientific letter

Mepolizumab and COPD in Real Life

Mepolizumab y EPOC en la vida real

Dear Editor,

Mepolizumab is a monoclonal antibody that targets circulating interleukin 5 (IL-5), inhibits its binding to its receptor and neutralizes its effect.[1] In 2015, mepolizumab was approved for uncontrolled severe eosinophilic asthma due to its efficacy in the withdrawal of systemic corticosteroid (SCS), exacerbations reduction, and improvement in lung function, quality of life and asthma control.[2–4] The chronic obstructive pulmonary disease (COPD) eosinophilic phenotype, defined as those patients with ≥300 serum eosinophils/mm^3 in the stable phase, has a good response to inhaled corticosteroids (ICS) and SCS.[5,6] Eosinophilic COPD patients with frequent exacerbations, despite a triple therapy, could benefit from mepolizumab.

We describe a 68-year-old male, former smoker with a pack-year index of 80, hypertension, type II diabetes mellitus, well controlled gastroesophageal reflux, severe obstructive sleep apnea (OSA) and chronic respiratory failure. The patient had frequent exacerbations (5 emergency department visits and 4 hospital admissions) the previous year. Pulmonary functional tests (PFT); forced vital capacity (FVC): 2660 milliliters (ml), (72%), forced expiratory volume in the first second (FEV_1): 1110 ml (39%), FEV_1/FVC: 38%, lung diffusion capacity (DLCO): 34%, total lung capacity (TLC): 134%, residual volume (RV): 228% and RV/TLC: 161%. Multiple brondodilator tests were negative. Chest computed tomography (CT) showed paraseptal emphysema predominantly in the upper lobes (right lung: 8.8%, left lung: 9.5%). Peripheral eosinophilia (300–500 eosinophils/mm^3) and a normal alpha-1 antitrypsin (129 mg/dl) value were found.

The patient was with SCS maintenance therapy (prednisone 7.5–10 mg/day) with clinical deterioration when trying to reduce SC dose. Besides, he was taking triple therapy (beclometasone 5/formoterol 87/glycopyrronium bromide 9 mcg: 2 inhalations every 12 h), theophylline, macrolides (anti-inflammatory doses), mucolytic and rescue medication (salbutamol and ipatropium). Roflumilast was not well tolerated due to gastrointestinal side effects. A correct device inhalation technique and treatment adhesion were proven.

Treatable features were studied. OSA treatment with continuous positive airway pressure (CPAP) was polysomnografy titrated with a low residual apnea hypopnea index. No bronchiectasis on chest CT, no signs of pulmonary hypertension on echocardiogram. There were no clinical or laboratory findings of malnutrition.

Mepolizumab 100 mcg subcutaneous (SC)/30 days was started due to serum eosinophilia, frequent exacerbations and corticodependence. Initially administrated in hospital (the first 3 doses) and later self-administered. After 3 months of treatment, SCS were successfully discontinued with a normal cortisol value (17 μg/dl). After one year of treatment with mepolizumab there were no exacerbations, improved quality of life (as measured by the COPD assessment test) and exercise tolerance in the 6-min walk test, peripheral blood eosinophil count below zero and less rescue medication was used. No improvements in PFT were observed.

Nowadays, mepolizumab is not approved for COPD treatment, although there is evidence in its favor. Pavord et al, in the METREX trial, showed reduction in the annual rate of moderate or severe exacerbations in COPD eosinophilic (300 eosinophils/mm^3 historical and/or 150 eosinophils/mm^3 at inclusion) patients treated with mepolizumab 100 mg SC/monthly. In addition, the time to the first moderate or severe exacerbation was longer with mepolizumab than with placebo in these eosinophilic patients.[7] However, Dasgupta et al trial included COPD patients with frequent exacerbations and sputum eosinophilia (>3%) and compared mepolizumab 750 mg intravenous/monthly with placebo. No differences in exacerbation rate were reported.[8] This finding probably suggests that serum eosinophilia could be a better biomarker than sputum eosinophilia to identify those patients who could benefit from mepolizumab. Ongoing clinical trials, such as MATINEE[9] and COPD-HELP,[10] will give more information about the role of mepolizumab in the treatment of COPD eosinophilic patients.

Therefore, mepolizumab in eosinophilic COPD patients with frequent exacerbations despite optimal treatment and adequate control of comorbidities could be a new therapeutic tool. Emphasising the importance of a high peripheral blood eosinophil count (300 eosinophils/mm^3 historical).

Conflicts of interest

The authors have no conflicts of interest to declare.

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